

MISSING TARGETS: THE ETHICAL NECESSITY OF  
FIREARM INJURY PREVENTION EDUCATION

---

A Thesis  
Submitted to  
the Temple University Graduate Board

---

In Partial Fulfillment  
of the Requirements for the Degree  
MASTER OF ARTS

---

by  
Arianna A. Ahiagbe, Sc.B.  
May 2020

Thesis Approvals:

Nora Jones, Ph.D., Thesis Advisor, Center for Urban Bioethics

## ABSTRACT

A modern version of the Hippocratic Oath instructs physicians that, “prevention is preferable to cure.” As healthcare providers, physicians promote healthy behaviors to prevent social issues from becoming health issues. Firearm violence is a social issue that has led to significant morbidity and mortality making firearm related-injuries and deaths a major health crisis of our time. If physicians have a role as credible messengers and advocates for firearm injury prevention, the educational institutions that form them must have a role as well. Unfortunately, firearm injury prevention education is rare in undergraduate medical education curricula. This poses an ethical dilemma. Undergraduate medical education without firearm injury prevention education misses the opportunity to equip trainees to discuss firearm violence as a health issue. As a result, physicians’ agency to advocate, educate patients, and thus fulfill ethical obligations may be limited. In this paper, physician codes of ethics are briefly presented. A case study of educational inquiry for medical students regarding firearm injury epidemiology, violence as a public health issue, the role of physicians in firearm policy, as well as clinical bedside skills related to firearm safety and injury is described. A case for firearm injury prevention education in undergraduate medical education curricula is made.

Soli Deo Gloria.

## ACKNOWLEDGMENTS

Thank you Lord!

Thank you to my first editor, my mommy.

I am because you are.

Thank you to my thesis advisor, Dr. Nora Jones.

Thank you to my elective advisor, Dr. Kathleen Reeves.

Thank you both for fiercely making room for my voice and ideas.

Thank you to my family and friends.

Thank you to my classmates.

Thank you to those who devote themselves to making our world a healthier place for all.

I am continually inspired.

## TABLE OF CONTENTS

ABSTRACT .....	II
ACKNOWLEDGMENTS .....	IV
CHAPTER 1: INTRODUCTION.....	1
CHAPTER 2: ETHICAL ARGUMENT .....	6
CHAPTER 3: CASE STUDY- A FIREARM INJURY PREVENTION COURSE .....	11
Class 1: Violence as a Public Health Issue.....	12
Class 2: Epidemiology and Social Determinants of Firearm Violence .....	14
Class 3: Law and Political Advocacy .....	19
Class 4: Clinical and Hospital-based Interventions.....	23
Class 5: Firearm Injury Journalism .....	26
Class 6: Community Education and Engagement .....	29
Class 7: Mental Health and Firearms .....	32
CHAPTER 4: CONCLUSION .....	36
BIBLIOGRAPHY .....	38

## CHAPTER 1: INTRODUCTION

Violence impacts our ability to be healthy. Around the world, the global health burden of violence is seen and felt at the individual level as well as the population level. Its effects can be immediate, lasting, and multigenerational (CDPH 2017).

Immediate effects include psychological trauma, physical injury, homicide, and suicide. Though there are various types of violence, firearm violence is often the deadliest. In 2017, 47,173 people died from suicide, making it the 10th leading cause of death overall in the United States, with just over half of these people (23,854) dying due to firearm-related injuries (Kochanek 2019). In 2017, 19,510 people died from homicide with 75% (14,542) dying due to firearm-related injuries (Kochanek 2019). These numbers reflect worsening trends as 2017 ushered in the highest numbers of United States firearm deaths recorded since the Centers for Disease Control and Prevention (CDC 2017) began including them in mortality data in 1979.

Overall in 2017, a total of 39,773 people died due to firearm-related injuries. Homicides are responsible for thirty-seven percent of this figure, while suicides account for sixty percent. The remaining three percent is attributed to unintentional deaths, deaths in war or legal interventions, and deaths that are undetermined.

This does not begin to account for non-fatal firearm-related injuries. Between 2013- 2017, on average about 100,000 people survived firearm-related injuries annually (CDC 2017). For those who survive, lasting effects may include physical disability,

chronic diseases, unhealthy risk behaviors, psychological impacts/disorders, and healthcare costs. (CDPH 2017).

Survival means physicians of most specialties will care for patients with a history of firearm-related injury. Emergency physicians triage. Radiologists assess injury via imaging. Anesthesiologists manage hemodynamic stability for surgery, Surgeons operate to repair physical trauma. Primary-care physicians and other specialties manage sequelae of injury. For the medical community, the impact is broad. Given the devastating realities of this health crisis, physician organizations including the American Academy of Family Physicians, American Academy of Pediatrics, American College of Emergency Physicians, American Congress of Obstetricians and Gynecologists, American College of Physicians, American College of Preventive Medicine, American College of Surgeons, and the American Psychiatric Association have called for reduction in U.S. firearm-related injuries and deaths (Comerci 1996, Olson 2007, ACEP 2014, APHA 2015, McMillion 2015, Pinals 2015, Weinberger 2015, Strong 2016, McLean 2019, Talley 2019).

Even broader are the multigenerational outcomes. The effects of firearm violence ripple through generations as changes in family structure, epigenetics, violence norms, employment, household income, economic mobility, educational performance, and criminal justice involvement (CDPH 2017). An early childhood education study identified higher rates of New York state standardized testing failure in third grade students whose neighborhood school catchment areas had higher rates of firearm

shootings. (Bergen-Cico 2018). A cohort study of patient-reported outcome measures showed unemployment and substance abuse increased 14.3% and 13.2% respectively after firearm injury (Vella 2019). These studies are significant because education and income are key predictors of health outcomes. Lower income is associated with greater likelihood of disease and premature death (Schiller 2012). While these studies demonstrate association and not causation, violence is a social determinant of health that impacts other social determinants of health. Thus, violence is a public health issue (Wolf 2014, Wintemute 2015).

In the United States, this declaration was established by the federal government in the 1979 Healthy People: The surgeon general's report on health promotion and disease prevention. The report prioritized violence among other issues for a national prevention agenda. It led to objectives calling for substantial reductions by 1990 in: (1) the number of child-abuse injuries and deaths, (2) rate of homicide among black males 15 to 24 years of age, (3) rate of suicide among 15 to 24 year olds, (4) number of privately owned handguns, and (5) improvements in the reliability of data on child abuse and family violence (US DHHS 1980).

The consequences of firearm violence saturate all facets of society. It is undeniably a social issue, an economic issue, a public safety issue, a criminal justice issue, and a health issue. Solutions should target both individual and population levels. Contributions from societal actors of all backgrounds and expertise are needed to help understand the issue better. Surely, healthcare providers such as physicians are among these actors. This thesis examines the role of undergraduate medical education in

preparing physicians to address the firearm violence endemic/epidemic in the United States.

The educational process to become a licensed and board-certified physician in the United States typically spans at least a decade. This accounts for baccalaureate, undergraduate medical and graduate medical education. Throughout this lengthy process, physicians are educated in epidemiology, etiology, physiology, pathology, diagnostics, therapeutics, prognostics, complications, and prevention of various medical conditions. This includes diseases as well as injuries.

In preclinical curriculum, firearm violence and subsequent firearm injury is often briefly acknowledged with minimal discussion during lessons on suicide, intimate partner violence, child safety, and post-traumatic stress disorder. Post-traumatic stress disorder is predictably taught in the context of the military with little or no acknowledgement of the broad reach of traumatic stress from community firearm violence. Its reach to any exposed community member including witnesses, victims, perpetrators, law enforcement, educators, and healthcare providers among others should be directly addressed. We are trained that firearm access is a risk factor for suicidality with no education on how to assess for access or counsel about healthy behaviors surrounding access. This limits the agency and competency of physicians in addressing major public health issues.

Long before medical students are licensed and board-certified physicians, they are often involved in management of firearm injuries in the clinical setting. This disconnect

in exposure to management but not prevention strategy is incongruent with our educational objectives.

In clinical clerkship curriculum, firearm violence is addressed as a part of lessons on penetrating trauma. Appropriately, the focus is on management including diagnostics, therapeutics, prognostics and complications. Still firearm violence and thus injury is entirely preventable. Thus, where in a decade's worth of curriculum should strategies to prevent one of the biggest health issues/crises of our time exist? What are physicians-in-training being taught about firearm injury prevention?

I began exploring these questions as a first-year medical student and still am as a fourth-year medical student. Throughout this time, I have become convinced that part of the answer resides in undergraduate medical education. Fortunately, my concurrent Masters of Arts in Urban Bioethics curriculum would elucidate a disconnect in medical curriculum that set me on a trajectory to establish the change that I wished to see in my own educational journey.

## CHAPTER 2: ETHICAL ARGUMENT

Various ethical codes exist to describe standards of physician conduct. Often cited is the Oath of Hippocrates of Kos. Its English translation from Greek states, “I will prescribe regimen for the good of my patients according to my ability and my judgment and never do harm to anyone.” This oath dates back to the 5th century BC. A more modern oath from the World Medical Association, originating in 1948 and most recently amended in October 2017, pledges that members of the medical profession “WILL PRACTISE my profession with conscience and dignity and in accordance with good medical practice; WILL SHARE my medical knowledge for the benefit of the patient and the advancement of healthcare.”

A more specific oath is A Modern Hippocratic Oath by Dr. Louis Lasagna.

Written in 1964, it declares:

I will remember that I do not treat a fever chart, a cancerous growth, but a sick human being, whose illness may affect the person's family and economic stability. My responsibility includes these related problems, if I am to care adequately for the sick. I will prevent disease whenever I can, for prevention is preferable to cure.

Though the original Hippocratic oath makes no specific mention of a patient's family and economic stability or prevention of disease, these concerns certainly promote the good of the patient. Preventing firearm violence addresses one of the leading causes

of injury and disease. Causes of firearm violence are multifaceted and require engagement beyond the scope of traditional medical practice.

These oaths are dependent upon medical education (Winau 1994). Today, physicians' knowledge, ability, and judgment are in part a reflection of what is learned during medical school and residency. Though they are continually forged by medical practice and commitment to lifelong learning, medical school provides an essential foundation. Thus, medical schools should provide foundational training regarding firearm violence prevention (Puttagunta 2016).

Many United States' medical schools promise to equip their students to do just that. For example, the Johns Hopkins School of Medicine's mission statement states that trainees "will understand and respond to factors that influence the social, behavioral, and economic factors in health, disease and medical care" (Molnar 2018). Howard School of Medicine mission statement states students will:

acquire current core knowledge to understand the impact of the various stages of life, as well as the effects of gender, life style, socioeconomic status, nutritional factors, genetic characteristics, psychosocial and epidemiologic factors, and culture upon the quality of human health and the prevalence of disease, disease prevention and health maintenance (Mission n.d.).

Further, the American Medical Association (AMA)'s principles of medical ethics require that a physician "shall respect the law and also recognize a responsibility to seek changes in those requirements which are contrary to the best interests of the patient. A physician shall recognize a responsibility to participate in activities contributing to the improvement of the community and the betterment of public health" (Riddick 2003). These ethical statements necessitate physician involvement in firearm violence prevention. This involvement requires education.

Around the country, medical schools are incorporating firearm violence prevention into the curriculum. McGovern Medical School in Texas offers an elective course entitled Gun Violence and Physicians: What You Need to Know. The course addresses mental health, advocacy, public health, and conversations students and doctors might have inside the clinic with patients about safe storage (Kalter 2019). The University of Massachusetts Medical School (UMMS) has developed an elective on firearm violence as well. The UMMS course provides students with lectures, simulations, field trips and group presentations to elucidate the current crisis of gun violence, how to incorporate preventive techniques into their practice and the current state of gun laws and regulations (Gray 2019).

National organizations such as Scrubs Addressing the Firearm Epidemic (SAFE) and American Foundation for Firearm Injury Reduction in Medicine (AFFIRM) are working to develop standardized firearm safety curricula for medical students. AFFIRM has a work group of healthcare professionals, gun owners, researchers, and patient advocates.

They are working with the Association of American Medical Colleges (AAMC) as well as several medical universities to help educate future physicians. SAFE is an organization of healthcare providers including doctors, nurses, paramedics and medical students. It has chapters at forty-nine U.S. medical schools. SAFE curriculum focuses on firearm violence prevention, gun laws, epidemiology and how to counsel patients at risk for firearm injuries (Gray 2019).

As part of my Masters in Urban Bioethics thesis work, I created a medical elective course to examine firearm violence prevention strategies. I was able to do so because there is much firearm violence and injury prevention work taking place in the Lewis Katz School of Medicine at Temple University (LKSOM) and Temple Health System in Philadelphia, Pennsylvania. As the 2016 Temple University Hospital (TUH) Community Needs Assessment delineates:

“Addressing Gun Violence. Philadelphia leads nation’s 10 largest cities in homicides per capita. Last year Temple’s Trauma Unit treated about 400 gunshots and other penetrating wound victims, the highest number in Pennsylvania. To address this epidemic, Temple’s Cradle to Grave program works with at-risk youth to help break the cycle of gun violence. In addition, our Turning Point intervention program takes advantage of teachable moments that exist during the post-injury/pre-discharge period for survivors of violence. Our Fighting Chance program is one of the nation’s few initiatives that teach community members how to provide basic first aid to victims of gunshot wounds. In addition, the Lewis

Katz School of Medicine at Temple University is a partner in the Philadelphia Cease Fire-Cure Violence program, a public health model focused on stopping killings in the 22nd and 39th Police Districts in North Philadelphia.”

Unfortunately, student exposure to such work within formal curriculum and via school-sponsored extracurricular activities is limited. This is in part due to lack of communication between students and faculty as well as an already demanding curriculum full with many other salient, and likely less controversial, issues. Resolving this disconnect can allow for the aforementioned medical ethics statements to be advanced and further applied in practice.

### CHAPTER 3: CASE STUDY- A FIREARM INJURY PREVENTION COURSE

The firearm injury prevention elective course, entitled “Don’t Shoot,” targeted LKSOM pre-clinical (i.e. first- and second-year) medical students. It sought to increase exposure to prevention efforts while addressing the following core competencies of the LKSOM curriculum:

- The ability to interact and communicate respectfully, effectively and empathetically with patients, their families, and the public; across all ages, socioeconomic and cultural backgrounds (LKSOM Interpersonal and Communication Skills 1)
- The ability to address sensitive health care issues in an effective, compassionate and non-judgmental manner, including screening for alcohol and substance abuse, domestic violence, sexual behavior and delivering bad news (LKSOM Interpersonal and Communication Skills 2)
- Demonstrate an awareness of the complexities of medical practice with regard to ethical and legal issues (LKSOM Systems Based 6)

As a supplemental offering, the elective provided seven class sessions, each with a unique theme that will be discussed below. Themes included 1) Violence as a Public Health Issue, 2) Epidemiology and Social Determinants of Firearm Violence, 3) Law and Political Advocacy, 4) Clinical and Hospital-based Intervention, 5) Firearm Injury Journalism, 6) Community Education and Engagement, and 7) Mental Health and Firearms. Sessions were co-developed with experts from within the LKSOM community

as well as from local bipartisan non-profit organizations. This allowed for gathering expertise from societal actors who carry out prevention work but may not necessarily interact with one another.

### Class 1: Violence as a Public Health Issue

Before diving into firearm violence prevention strategies, it was important to establish a shared understanding of violence as a health issue. The Violence as a Public Health Issue session introduced a framework of violence as a multifactorial contagion. This session was co-developed with a pediatrician who is also the director of the LKSOM Center for Urban Bioethics and helms one of the only evidence-based violence intervention programs in Philadelphia. We discussed genetic and environmental factors, acknowledging that there was much more known about the latter than the former. We noted studies that have associated genes involved in dopaminergic and serotonergic neurotransmission with aggressive human behavior (Fernandez-Castillo 2016). We also noted the vast research opportunities that candidate gene and genome-wide association studies offer for learning more about the genetics and epigenetics of violence and trauma in the future.

Regarding environment, we highlighted social learning theory via Bobo doll experiments to establish violence as a learned behavior (Bandura 1977). Among other things, this experiment of children modelling adults hitting a Bobo the clown doll helped us understand how interpersonal violence spreads. Violent behavior begets violent behavior.

This was further embodied in the CDC-Kaiser Permanente Adverse Childhood Experiences Study (ACES) which identified a graded dose-response relationship between adverse childhood experiences and risk for negative outcomes. These outcomes included increased risk for victimization and perpetration of interpersonal violence, victimization via sexual violence, cancer, chronic obstructive pulmonary disease, ischemic heart disease, obesity, liver disease, and sexually transmitted diseases (Hillis 2000, Williamson 2002, Dong 2003, Whitfield 2003, Anda 2008, Holman 2016, Ports 2016, Voith 2017).

In the first wave of the ACES data collection, adverse childhood experiences were defined as psychological, physical, or sexual abuse; violence against mother; substance abuse or mental illness in the household; incarcerated household member, and parental separation or divorce (Felitti 1998). Emotional or physical neglect were added as categories in the second wave of data collection. Adverse childhood experiences in any of these categories increased the risk of attempted suicide 2- to 5-fold across the life span (Dube 2001). Other adverse health outcomes from ACES that were also partial mediators of increased suicide risk include alcoholism, illicit drug use, and depressed affect (Dube 2001).

This connected adverse childhood experiences to the leading cause of firearm mortality in the United States. It demonstrated how lifestyle choices such as alcohol and drug use and sexual behavior were inextricably linked to social determinants of health including employment, stress, safety, and support systems. To address firearm violence,

one must effectively address social determinants of health. Social determinants of health were often social determinants of violence.

In that vein, we ended the session discussing the epidemiology of firearm violence and injury in the United States. Firearm violence has affected any and all of society's members. A major takeaway for the elective's students in this session was a greater appreciation for the diversity in causes of firearm injury. Students understood that firearm injury is a wide-reaching health issue but were surprised to learn that suicide is the leading cause of U.S. firearm mortality. As a physician, an effective way to address rural firearm violence issues of suicide might be different from an effective approach to domestic disputes involving interpersonal firearm violence in urban areas that might be different from approaches to drug-related firearm violence in suburban areas. Students appreciated that firearm injury prevention required targeted approaches relevant to the social determinants faced by the community.

#### Class 2: Epidemiology and Social Determinants of Firearm Violence

The Epidemiology and Social Determinants of Firearm Violence session was co-developed with a trauma surgeon who has expertise in firearm injury prevention, global surgery, and public health research. In this class, we further examined firearm injury epidemiology as well as the overlap between social determinants of health and social determinants of violence.

To better understand social determinants of violence, we began by regarding how social structures beget social determinants of health using the example of Flint, Michigan. We discussed how children in this city with elevated blood lead levels led a pediatrician to uncover faulty public water infrastructure managed by public/government officials. This water crisis taught us how social structures impact one's ability to attain fundamental resources and one's ability to be healthy. Social structures included but were not limited to marriage, family, nation, ethnic group, government, educational institutions, cultural and religious organizations, commerce, trade and industry; work and labor groups, recreational groups, political and international organizations. Structural violence occurred when unequal power within these structures allows for unequal distribution of resources resulting in unequal life chances (Galtung 1969).

It was critical that the students (i.e. soon-to-be physicians) understand how structures harm the health of patients. Structures such as family, educational institutions, commerce, trade, and industry and labor groups could manifest unequal life chances in where one lives and works. Where and with who one lives and works were social determinants of health that were also social determinants of violence. We re-emphasized ACES, stressing that social determinants of health and violence were both personal and structural. In medicine, the personal aspect could often be characterized in terms of choice and responsibility, yet this explanation would remain incomplete without parallel discussion of social structures, organizations, and institutions. Structural and personal factors have always operated interdependently. It has been important not to allow the visibility of people to obscure the processes by which society functions and health is

impacted. In the firearm violence crisis, as in the Flint water crisis, the visibility of people should aid in elucidating how social structures function.

Depending on its application, racism could render people highly visible or invisible while exerting significant influence on social structures. When structures have perpetuated racism, they were violent. Structural racism has been defined as institutions, ideologies, and processes that operate at a socioecological level and which are able to adapt to changing sociopolitical contexts and persist over time (Gee and Ford, 2011; Jacoby 2018) There have been numerous pathways between structural racism and health. These included economic and social deprivation, environmental and occupational health inequities, psychosocial trauma, targeted marketing of health-harming substances, inadequate health care, state sanctioned violence, mass incarceration, alienation from property and traditional lands, political exclusion, maladaptive coping behaviors, and stereotype bias (Bailey 2017).

Throughout the class, we reviewed epidemiologic data to elucidate how these pathways led to social determinants of health and violence and informed disparities seen in firearm injury incidence and prevalence. For example, we employed a cartographic public health study of Philadelphia residential security maps (Jacoby 2018). In the 1930s, the United States' government commissioned maps to identify less risky areas to provide economic investment for housing. Race and ethnic background were incorporated into the assessment (Guttentag 1980). Areas deemed more risky for economic development were graded as “red zones” based on dilapidated housing, informal settlements, or “undesirable

populations” of Blacks, immigrants, and Jews (Hillier 2005). Furthermore, this mapping initiative occurred across two hundred and thirty-nine cities in the United States (Hillier 2003). After controlling for demographics, the Philadelphia cartographic public health study found rates of firearm-related injury in 2014 to be eight times higher in these historic red zones compared to the historic green zones that were considered first-rate (Fabio 2009, Jacoby 2018). This associated economic and social deprivation with geographic distribution and rate of firearm injury. Further, this related structural violence over eighty-years in the making with recent firearm violence, health outcomes, and disparities.

Though well-established, structural violence could be addressed and discontinued. Moreover, firearm violence and subsequent injury has been and continues to be entirely preventable. The class session progressed with a review of possible solutions for the social determinants of violence discussed. Racism has been a powerful contributor to social determinants that led to firearm violence. Bias, whether implicit or explicit, laid the foundation. Development of effective firearm injury prevention strategies has been hindered by limited understanding of contributing factors, including the key role that racism played. Physicians, and any societal actors for that matter, have done a disservice to their efforts by avoiding or failing to adequately address biases that structure pathways to health disparities and unequal life chances, especially with regard to gender and race in firearm injury prevention.

Research has been essential to identifying and understanding these pathways. Next in this session, we reminded students that the research that helps us understand disease and injury as well as establish best practices is not immune to structural violence. The limitation on gun violence research imposed by the United States government has slowed identification, understanding, and thus effective prevention strategy and efforts. This has been seen and felt in significant part due to the 1996 appropriations bill rider, known as the Dickey Amendment (Omnibus Consolidated Appropriations Act, 1996 and Consolidated Appropriations Act, 2012) . Until 2018, it prevented the CDC and National Institutes of Health (NIH) from funding research that would “advocate or promote gun control” (Omnibus Consolidated Appropriations Act, 1996 and Consolidated Appropriations Act, 2012) .

This amendment as well as the lack of a standardized reporting system for firearm violence has contributed to a critical gap in firearm violence data available for research. Firearm-related fatalities when reported utilized a standardized death certificate that is reported to a local health department and then the CDC (Weiner 2007, Webster n.d.) . No standardized data collection strategy for non-fatal shootings has been implemented allowing incidents to go unreported. There have been physician-led efforts to improve this. For example, the American College of Surgeons established the National Trauma Data Bank to standardize data about trauma patients including firearm injury patients. This data source collected information from a registry of verified trauma centers in the United States. Collecting firearm violence data in a standardized fashion across the country could better allow for understanding of national trends, patient outcomes,

hospital resources, and research efforts. We rationalized that if societal actors cannot reasonably/accurately define the nature and extent of the issue, it is even more difficult to implement and assess interventions such as laws and prevention programs.

Student feedback centered on the depth of intersectionality possible in medicine. They were excited by the various avenues to tackle social determinants of health and violence. Students were especially excited to learn that the co-developer is a surgeon as many had previously thought a surgical specialty might not be conducive to firearm injury and other preventive health work.

### Class 3: Law and Political Advocacy

For the Law and Political Advocacy session, we examined the intersectionality of physicians, lawmakers, policymakers, and advocates. The session was co-developed by a family and sports medicine physician who is also a political lobbyist for sports and firearm injury prevention. It was also developed by an attorney who is a public policy advocate from CeaseFire PA, a nonpartisan nonprofit firearm violence prevention organization for the Commonwealth of Pennsylvania.

Social and health policies have always determined who gets sick and who gets care, and where, and how (Cannuscio 2019). We discussed how this is directly reflected in the patient population that physicians have a duty to serve. If policies are to help patients, various societal actors including physicians need to be involved in their creation. We pondered whether a solution can be complete if the people who have to execute it are

not a part of the decision making. Further we questioned, who better to advise societal agents charged with creating policies and laws that affect health than agents with primary exposure and insight?

Physicians have had a storied history of creating and influencing United States policy. From surgeon general warnings, to seatbelts, bicycle helmets, choking hazards, alcohol consumption limits, and non-smoking policies, physicians have lent their voice to various social issues related to the health of the population. In some cases, physicians have been policymakers and lawmakers. Currently, there are sixteen physicians, one dentist, and one optometrist holding Office in the 115th United States Congress. Four are members of the Senate, while the remainder occupy seats in the House of Representatives. Physicians also serve at municipal and regional levels to enact change.

More commonly physicians wielded influence as expert consultants or lobbyists. Given their unique credibility, physicians often served as trusted community advocates for policies that decrease morbidity and mortality (He 2018). The physician voice has benefited various types of policies, not only health policy. Social determinants of health have been shaped by health policy and even more so by sociopolitical and economic policies. The social determinants of health and violence that contributed to firearm injury are no exception.

Physicians involved in firearm injury prevention work are bolstered by an understanding of current firearm policies. To gain a foundational understanding of

Pennsylvania firearm laws, we reviewed the Second Amendment of the United States Constitution as well as journeyed stepwise through the process of becoming a firearm owner in Pennsylvania and licensed to carry for vehicles and Philadelphia county. Further we examined the intersectionality of firearm laws and medical evaluation.

The ethics and appropriateness of utilizing the medical interview during a clinical patient encounter as a vehicle for physician assessment of patient firearm safety is a worthwhile and necessary discussion that we introduce in this class and expand in the next session on Clinical and Hospital-based Interventions. States including Minnesota, Missouri, and Montana have laws that regulate firearm data collection by physicians but not counseling (Gilchick 2018). Currently, no laws exist to prohibit physicians from counseling patients about firearms, though there have been attempts (Gilchick 2018). Most notable is the 2011 Firearm Owners' Privacy Act (FOPA) enacted in Florida. Colloquially known as "Docs versus Glocks," FOPA prohibited physicians from asking about firearm ownership (Zabel 2014, Bowman 2015). The case stemmed from a pediatrician who was sued for inquiring about guns in the home during a clinical patient encounter. After a six year legal battle of appeals, FOPA was ultimately found to violate the First Amendment and overturned in 2017 (Applebaum 2017).

Even more controversial has been the medical interview as a means to assess risk factors for firearm injury as well as patient competency for firearm ownership or permit to carry (Goldstein 2013;2014; 2015, Goldstick 2017, Jones 2018). The firearm violence problem in the United States has existed as one of a kind due to greater autonomy to

possess instruments of lethal force in comparison to peer countries. At times, physicians might find themselves in a position to advocate for limiting or extending this autonomy for patients. Legal decisions influenced by physicians include the right to carry firearms as well as the need for an extreme risk protection order (ERPO) also known as a “red flag” or “gun restraining” law, which temporarily limits at-risk person’s access to firearms. Currently, 15 states have enacted ERPO laws or similar policy (Pallin 2019). We discussed how competency is a legal concept, not a medical one and how physicians can responsibly, ethically, and appropriately wield influence to prevent injury, and the role of medical education in preparing them for such (Gondi 2019).

Physicians involved in firearm injury prevention work are also bolstered by partnership. We outlined the various partnerships that led to our physician co-developer being consulted for concussion injury policy and firearm injury prevention policy. This session reinforced the notion that physicians can and should collaborate with government officials, public health professionals, media, educators, law enforcement, business owners and the community at large to ensure multifaceted approaches to policies and prevention work. Partnership has been essential to effective advocacy. Additionally, students were surprised to learn that there are several branches of firearm violence advocacy including community violence, police violence, and suicide, etc.

Another key takeaway in this session came via the co-developers who had not met prior to the class. In the course of teaching, they recognized a mutual colleague and made plans to collaborate outside of the elective in the future. This provided a clear example of

societal actors who carry out prevention work but who may not necessarily interact with one another.

#### Class 4: Clinical and Hospital-based Interventions

The Clinical and Hospital-based Interventions session was co-developed by the trauma surgeon and trauma outreach coordinator who establish and oversee TUH's firearm injury prevention and intervention programs. In this class, we discussed various approaches to educate and empower patients to make safe and healthy decisions that prevent firearm injury. This was in keeping with the notion that a solution is incomplete if the people who have to execute it are not a part of the decision-making process.

We proposed that patients typically enter the clinical setting with a desire to be healthy and a pursuit of expertise. The onus is then on the physician to create a safe environment for discussing difficult subject matter and managing fear of morbidity and mortality. As with domestic violence and cigarette and alcohol use, physicians have routinely utilized the medical interview to screen patients for risk behaviors and promote healthy behaviors in order to prevent social issues from becoming health issues (Ewing 1984, Krasnoff and Moscati 2002, Heckman 2010, O'Campo 2011, Lindson-Hawley 2015).

In the context of this interaction, we discussed how to approach patients about firearm safety in a non-accusatory manner, without assumptions about their firearm safety knowledge, and with a focus on health-related aspects of firearm possession. We

then progressed to engagement, specifically how to ask patients about access, ownership, and risk behaviors. Concerns included whether the firearm is locked, loaded, accessible to children or people with increased risk for a suicide attempt including dementia, depression, and post-traumatic stress disorder (Patterson 1987, Campbell 2007, Seyfried 2011, Pinholt 2014, Williamson 2014). Afterwards, we assessed risk and counseled accordingly including safe storage for those deemed at low risk for firearm injury and decreased access or disposal in those deemed high risk. We also addressed how to interact with patients after a traumatic event and how to help them cope. Lastly, we discussed how healthcare providers cope. Students were particularly moved by our co-developers' ability to channel their deep emotional connection to prevention work in healthy and positive ways. Unfortunately, despite self-reported knowledge of firearm safety counseling, most physicians would say they counsel sometimes, rarely, or never (Damari 2018).

In addition to the medical interview, there were several programs in the clinical setting that physicians could be involved in to empower patients to become better decision makers. TUH's hospital-based intervention programs included Cradle 2 Grave, Turning Point, Fighting Chance, and Safe Bet. We discussed the programs and news media coverage of the programs including praise and critiques. The following is a brief description of each program.

Cradle 2 Grave (C2G) is an educational violence prevention program that aims to change attitudes about guns and violence in at-risk youth. Participants are groups of school students or adjudicated youth aged thirteen or older. Participants learn the story of

a patient, a 16-year-old boy who was fatally wounded with twenty-four gunshots. The two-hour program includes a tour from trauma bay to morgue and an introspective classroom discussion. A prospective study found C2G to be effective especially in decreasing aggressive attitude in response to shame (Goldberg 2010).

Turning Point (TP) is an inpatient violence intervention program that aims to change attitudes about guns and violence in firearm violence survivors. Patients who survive firearm injury can enroll in TP to receive counseling and support services in addition to traditional social work services. Patients enrolled in TP have the opportunity to watch their trauma bay video which provides a bird's eye view of their resuscitation. Other program components include psychiatric evaluation and therapy, an outpatient case manager, GED/job opportunities, and meeting with a fellow gunshot wound survivor. A two-year prospective randomized study comparing TP to traditional social work services found TP was effective in changing attitudes toward guns and violence among victims of penetrating trauma but stated that longer follow-up is needed (Loveland-Jones 2016).

Fighting Chance is a community-driven emergency preparedness program in which medical providers teach community members first aid skills and bleeding control techniques including how to tie a tourniquet (Burton 2016). It is modeled after the Stop the Bleed Campaign, a 2015 national initiative developed by physicians in the National Center for Disaster Medicine and Public Health. The center is a collaboration of the U.S. departments of Health and Human Services, Homeland Security, Defense Transportation, and Veterans Affairs. Stop the Bleed is promoted via partnerships with various national

organizations including the Major Cities Police Chiefs Association and the American College of Surgeons.

Safe Bet is the hospital's free gun lock program. Though police stations throughout Philadelphia offer free gun locks, people may be more apt to seek gun locks from medical providers rather than law enforcement. More individuals and institutions providing gun locks may mean greater access to firearm safety measures and greater opportunity for firearm injury prevention.

Each of these programs, though not without controversy- particularly in regard to preventing retraumatization-, have demonstrated the continual need for partnerships to bolster firearm injury prevention efforts. The elective's students felt that the hospital based intervention programs would benefit from an evaluation research partnership that could provide longitudinal prospective evaluation of the programs. This would create data to assess the intervention's efficacy and evidence to make recommendations.

#### Class 5: Firearm Injury Journalism

The Firearm Injury Journalism session was a field trip to the inaugural Better Gun Violence Reporting (BGVR) Summit 2019 at WHYY in Philadelphia. It was organized by the Initiative for Better Gun Violence Reporting, a journalist-led project that posits, "What if changing the way journalists report on gun violence could prevent shootings and save lives?" The trauma surgeon who co-developed the Epidemiology and Social Determinants class session was also involved in planning the summit and encouraged us

to attend. It felt prudent given the significant role that mass media plays in society's understanding of firearm violence and injury. We attended the one day event to better understand how medicine in general and physicians in specific intersect with news media to further firearm injury prevention efforts.

In preparation for the profession, medical education has equipped physicians to be expert reporters in the clinical setting. Often this expert reporting might extend outside of the clinical setting and lend itself to serving as a source or contributor to news media. Collaborating with journalists or working as a medical journalist could offer opportunities to influence narratives and amplify voices central to firearm injury prevention. A common form of physician contribution to advocacy journalism has been the op-ed. Recent examples included: a neurosurgeon advocating for extreme risk protection orders (Siddique 2014), an emergency medicine physician explaining how to tell a mother that her child is dead (Rosenberg 2016), a pediatrician explaining gun violence as a public health crisis (Fielding 2018), and a radiologist describing wounds inflicted by AR-15 semiautomatic rifles in the Parkland, Florida mass shooting (Sher 2018).

Along the journey to becoming a physician, medical students have also contributed to firearm injury crisis narratives. After shadowing in the emergency department, LKSOM students have written about the effects of witnessing and participating in medical management of firearm injuries first-hand including discovering a reality of guns that is different from one's upbringing (Haslam 2018) and seeing a

teenager die for the first time as a first-year medical student (Curran 2019). The latter experience also spawned a photojournalism project in the New York Times.

In preparation for the summit, the previous Don't Shoot class sessions served us well. The Epidemiology and Social Determinants session challenged students to be vigilant and proactive about data sources and their quality as good data can yield practices and solutions that yield equity and justice. Having been introduced to different types of firearm violence advocacy in the Law and Political Advocacy session, students were prepared to dive into the summit's focus on news media coverage of community violence.

The BGVR summit was a diverse gathering of societal actors: journalists, researchers, social workers, public health officials, a high school journalism club, and medical professionals including many attending and resident physicians from the TUH emergency department. The focus was on identifying best practices for investigative and advocacy journalism about firearm violence. Most relevant for our students was a panel Organized by The Coalition of Trauma Centers for Firearm Injury Prevention. The panel discussed how information and data about firearm violence are used to convey messages to get the public to react and to aid in long term policy solutions. It featured an update of firearm violence in Philadelphia from the chief epidemiologist at the Philadelphia Department of Public Health. Additionally it included reporting from a former trauma nurse turned injury science and urban public health researcher and professor, a criminal justice professor, and trauma surgeons.

Journalists and other societal actors that we encountered throughout the day repeatedly remarked on the value of physicians' perspectives in their line of work. Students found this humbling and remarkable. Students were also surprised to learn about the varied sources that journalists call upon when writing a story about firearm violence including religious leaders and funeral home directors. This served as an important reminder that anyone can play a valuable role in firearm injury prevention and emphasized the necessity of building trust in our own communities to engender support in prevention work.

#### Class 6: Community Education and Engagement

It has been said that people want to know that you care before they care what you know. The Community Education and Engagement session highlighted the need for community partnerships in order to influence and shift community norms. This session concentrated on interruption of urban violence in at-risk youth. The class was co-developed by an attorney who is also the director of Philadelphia Ceasefire -Cure Violence (CV) and a CV outreach worker.

We began by reviewing the Cure Violence model developed by infectious disease physician, Dr. Gary Slutkin (Slutkin 2013; 2014; 2015; 2018). The CV model has approached violence as contagion that behaves and responds as a disease. The model has utilized community outreach workers known as "interrupters" who have an ethical obligation and convey credibility and authority in neighborhood community settings

analogous to that of physicians in the clinical community settings. Interrupters were recruited from the community and have partnered with the community in the streets, schools, and hospitals among other locations. Their straightforward aim has been to strengthen the community by getting people to “stop shooting people.” To that end, those three words were emblazoned on the side of their outreach vehicle, a winnebago. Interrupters engaged consistently with at-risk community members as mentors and conflict mediators in order to educate and interrupt the thought process that one’s grievance is worth shooting someone over. (Whitehill 2014). While the attitude shift might or might not resolve the grievance, it prevented conflict escalation to a shooting and made room for other opportunities such as recreation, educational attainment, or employment. Further opportunities for interrupters to engage included partnering with school administrators to promote anti-bullying programs in order to reduce the culture of violence in school. CV interrupters have also hosted events such as basketball games and cookouts to build community dialogue and trust. The CV model has led to a reduction in firearm injury incidence (Butts 2015; Ransford 2016) and thus a reduction in the immediate, lasting, and multigenerational effects that transform communities.

Next, we briefly reviewed United States’ youth mortality data from the CDC. Though the World Health Organization (WHO) has defined an adolescent as a person between ten to nineteen years of age, adolescence in the literature is variably defined as low as ten and as high as twenty-four years of age. Per the CDC, the leading cause of death for adolescents overall is unintentional injury. For, Black/African American male adolescents, it is homicide. This disparity was found in 1979-1989 when adolescent data

referred to blacks and whites aged fifteen to nineteen (Fingerhut 1992). It was described again from 1996-2006 for twelve to nineteen-year-olds of black, white, and Hispanic descent (Minino 2010).

It has been described in 2017 as well: for five to fourteen-year-old black males, homicide is the second leading cause of death and becomes the leading cause at fifteen until thirty-four years of age (Curtin and Heron 2019). In comparison, with the exception of twenty to twenty-four year old Hispanic males, no other groups from age five to thirty-four count homicide among the top two leading causes of mortality (Curtin and Heron 2019). Groups include those of black female, white, Hispanic, American Indian/Alaska Native, and Asian/Pacific Islander descent. In Philadelphia, the majority of adolescent homicides are due to firearm-related injury and in keeping with national data, disproportionately affect young black males (Fox 2008, Smith 2015, Hohl 2017). The literature suggests what is most or second most likely to end their life essentially from kindergarten through 34 years old is being shot by someone else. How has community building been affected by this narrative?

The co-developer, who is a CV interrupter, impressed upon us the trauma of growing up exposed to firearm violence and unequal life chances that surround it. He implored us to slow down/ground prevention ideas and efforts in sincere attempts to learn and care about what the community members that we serve have been through and what they are up against.

Throughout the course, all of the elective students, including those for whom this is their lived reality, had shared openly, and this openness fostered the community we needed to learn and have sensitive and sometimes difficult discussions. At this juncture in the course, ACEs and social determinants learned in previous classes help students contend with how this disparity for American children, teenagers, and young adults came to be and why it persists. Research ideas and advocacy skills learned in previous sessions help students contend with possible interruptions to and solutions for the disparity. The education and engagement session demanded that we contend with how we not just as physicians but as people extend humanity to reach other people effectively outside of typical dynamics such as the physician-patient relationship or clinical setting. An example was consistently volunteering at a local recreation center or church. Students were encouraged to know that there are opportunities to intervene and tackle firearm violence just by being a consistent presence in the community and not just during instances where there is a need.

#### Class 7: Mental Health and Firearms

Exposure to violence impairs physical and psychological safety and begets trauma. Trauma influences individual behavior and community norms, both of which impact health. For effective and holistic firearm injury prevention work, trauma must be centered and cannot be underemphasized. The previous Community Education and Engagement session emphasized how trauma and violence interrupt community. In the

Mental Health and Firearms session, we studied how trauma and violence impact the brain and mind.

Among many outcomes, traumatic experiences and injury have led to post-traumatic stress disorder (PTSD). PTSD has been commonly and appropriately associated with military experiences (Keane 2004). Still, PTSD has always been a much broader health issue causing significant neurobiological changes (Monson 2004, Hughes 2011). Physicians have had a responsibility to engage it as such. In this session, we discussed PTSD in relation to various associations including but not limited to military service, law enforcement, first responders, interpersonal community violence, and mass shootings.

Such exploration parlayed into a more nuanced conversation about firearm injury narratives and drew ideas from the previous Firearm Injury Journalism session. We discussed the need for health-focused narratives to combat the ways in which politically driven or media-driven narratives of firearm violence have sometimes spread misinformation and contributed to the contagion effect of violence (Swanson 2015, Meindl 2017). Medical literature has often found that access to firearms is positively associated with risk of firearm violence and injury including but not limited to threatening someone with a gun, homicide in the home, suicide overall and especially youth suicide (Kellerman 1993, Miller 2008, Brent 2013, Knopov 2019, Lu 2019). From there, we discussed the intersections of firearm injury and suicide epidemiology. When a suicide attempt was made with a firearm, it was significantly more likely to be completed (Duggan 2003). Overall, suicide was the tenth leading cause of death in the United States

in 2017, with over half being attributed to firearm-related injuries (Kochanek 2019). Hence why firearm injury prevention and suicide prevention has remained closely interrelated.

Harkening back to the Clinical and Hospital-based Interventions session, we emphasized the need for firearm safety screening and counseling with specific considerations being given to people with increased risk for a suicide attempt including a previous attempt, dementia, depression, domestic violence, substance use disorder, and post-traumatic stress disorder as well as youth and veterans (Patterson 1987, Bukstein 1993, Campbell 2007, Balis 2008, Devries 2011, Seyfried 2011, Pinholt 2014, Williamson 2014, Wolf 2014, Betz 2018, Pallin 2019). After unintentional injury, suicide was the second leading cause of mortality in fifteen to twenty-four year-olds in 2017 (Curtin and Heron 2019). Looking more closely, in ten to nineteen-year-old Asian females and fifteen to twenty-four year-old Asian males, suicide is the leading cause of mortality (Curtin and Heron 2019). At the other end of the age spectrum, adults over 65 years old are associated with increased risk of depression, suicide, and cognitive decline with (Pinholt 2014). In this age demographic, 91% of all firearm-related deaths are suicides and are more commonly white males (CDC 2017). Among military veterans of all ages, 75% of suicides involved a firearm (Miller 2012).

We again contended with why disparities exist and persist as well as how more or better research efforts can help us understand firearm injury issues. We emphasized trauma-informed and healing-centered approaches to combat stigma around trauma and

mental illness (Ginwright 2018). We also acknowledged the time constraints of the clinical patient interaction, further underscoring how better knowledge and training can improve firearm injury prevention efforts in addition to longer clinical encounter times.

We would have been remiss to discuss suicide and not acknowledge the prevalence of suicide and suicidal ideation among healthcare professionals especially those experiencing burnout or depression (Dyrbye 2008, Andrew 2015, Rothenberger 2017). Working as a healthcare professional could be traumatic necessitating healthy coping mechanisms as well as organizational, professional, and personal support. We recounted this reality with a current LKSOM third-year medical student, who had written an op-ed in the Philadelphia Inquirer after a transformative experience managing firearm injuries in the TUH trauma bay (Haslam 2018). The author importantly described identifying support from faculty to help process the experience as well as writing as a therapeutic coping mechanism and an act of advocacy. Students were excited to learn from a peer and saw themselves more immediately reflected in the experience.

## CHAPTER 4: CONCLUSION

The Don't Shoot preclinical elective is an extensive firearm injury prevention course. Much of the subject matter of the Don't Shoot preclinical elective is vital, not supplemental, and should be included in the main LKSOM medical curriculum - and in the curriculum of medical schools across the country - to produce physicians that are better equipped to address one of the major public health issues of our time.

No matter the specialty, physicians in the United States and abroad will invariably provide care to patients who have been exposed to firearm violence, not to mention their own personal exposure as members of American society. In a survey of two-hundred and twenty-two North Carolina physicians, eighty percent of these physicians agreed or strongly agreed that gun violence is a major public health issue that should be part of medical training (Damari 2018). Physicians have a duty to prevent and manage firearm-related injuries and deaths. Those who reported attending continuing medical education (CME) courses on firearm safety and psychiatrists were more likely to report knowledge of firearm safety counseling and more likely to counsel patients often or very often (Damari 2018). This suggests that education gives physicians agency to address the firearm injury crisis and fulfill ethical obligations. Thus, more firearm injury prevention education is necessary across undergraduate, graduate, and continuing medical education (Puttagunta 2016).

By promoting firearm injury prevention via curriculum, institutions of undergraduate medical education enhance students' fund of knowledge thereby activating agency and supporting ethical obligations. Among others, these obligations include to "share medical knowledge for the benefit of the patient and the advancement of healthcare," "respect the law and also recognize a responsibility to seek changes in those requirements which are contrary to the best interests of the patient," "recognize a responsibility to participate in activities contributing to the improvement of the community and the betterment of public health," and prevent disease and injury whenever possible. As the Modern Hippocratic Oath reminds us, "prevention is preferable to cure."

## BIBLIOGRAPHY

American College of Emergency Physicians. (2014). Firearm safety and injury prevention. Retrieved from <https://www.acep.org/patient-care/policy-statements/firearm-safety-and-injury-prevention/>

American Public Health Association. (2015). Support Renewal with Strengthening of the Federal Assault Weapons Ban. Washington, DC: American Public Health Association; 2003.

Anda, R. F., Felitti, V. J., Bremner, J. D., Walker, J. D., Whitfield, C. H., Perry, B. D., ... & Giles, W. H. (2006). The enduring effects of abuse and related adverse experiences in childhood. *European archives of psychiatry and clinical neuroscience*, 256(3), 174-186.

Andrew, L. B., & Brenner, B. E. (2015). Physician suicide. *Medscape Drugs Dis*, 17.

Appelbaum, P. S. (2017). "Docs vs. Glocks" and the Regulation of Physicians' Speech. *Psychiatric services*, 68(7), 647-649.

Bailey, Z. D., Krieger, N., Agénor, M., Graves, J., Linos, N., & Bassett, M. T. (2017). Structural racism and health inequities in the USA: evidence and interventions. *The Lancet*, 389(10077), 1453-1463.

Balis, T., & Postolache, T. T. (2008). Ethnic differences in adolescent suicide in the United States. *International journal of child health and human development: IJCHD*, *1*(3), 281.

Bandura, A., & Walters, R. H. (1977). *Social learning theory*(Vol. 1). Englewood Cliffs, NJ: Prentice-hall.

Beard, J. H., Morrison, C. N., Jacoby, S. F., Dong, B., Smith, R., Sims, C. A., & Wiebe, D. J. (2017). Quantifying disparities in urban firearm violence by race and place in Philadelphia, Pennsylvania: a cartographic study. *American journal of public health*, *107*(3), 371-373.

Bergen-Cico, D., Lane, S. D., Keefe, R. H., Larsen, D. A., Panasci, A., Salaam, N., ... & Rubinstein, R. A. (2018). Community gun violence as a social determinant of elementary school achievement. *Social work in public health*, *33*(7-8), 439-448.

Betz, M. E., McCourt, A. D., Vernick, J. S., Ranney, M. L., Maust, D. T., & Wintemute, G. J. (2018). Firearms and dementia: clinical considerations. *Annals of internal medicine*, *169*(1), 47-49.

Bowman, M. S. (2015). Docs v. Glocks: Speech, Guns, Discrimination, and Privacy-Is Anyone Winning. *Fla. L. Rev.*, *67*, 1455.

Brent, D. A., Miller, M. J., Loeber, R., Mulvey, E. P., & Birmaher, B. (2013). Ending the silence on gun violence. *Journal of the American Academy of Child and Adolescent Psychiatry*, 52(4), 333.

Bukstein, O. G., et al. "Risk factors for completed suicide among adolescents with a lifetime history of substance abuse: a case-control study." *Acta Psychiatrica Scandinavica* 88.6 (1993): 403-408.

Burton, J. (2016, March 2). Program gives gunshot victims a chance at survival. Retrieved from <https://news.temple.edu/news/2016-03-01/program-gives-gunshot-victims-chance-survival>

Butts, J., Wolff, K. T., Misshula, E., & Delgado, S. (2015). Effectiveness of the Cure Violence Model in New York City. *New York: John Jay Research and Evaluation Center*.

Campbell, D. G., Felker, B. L., Liu, C. F., Yano, E. M., Kirchner, J. E., Chan, D., ... & Chaney, E. F. (2007). Prevalence of depression–PTSD comorbidity: Implications for clinical practice guidelines and primary care-based interventions. *Journal of general internal medicine*, 22(6), 711-718.

California Department of Public Health. (2017). Preventing Violence in California Volume 1: The Role of Public Health. *Sacramento, CA: California Department of Public Health*.

Campbell, D. G., Felker, B. L., Liu, C. F., Yano, E. M., Kirchner, J. E., Chan, D., ... & Chaney, E. F. (2007). Prevalence of depression–PTSD comorbidity: Implications for clinical practice guidelines and primary care-based interventions. *Journal of general internal medicine*, 22(6), 711-718.

Campbell, S., Nass, D., & Nguyen, M. (2018, October 4). The CDC Is Publishing Unreliable Data On Gun Injuries. People Are Using It Anyway. Retrieved from <https://fivethirtyeight.com/features/the-cdc-is-publishing-unreliable-data-on-gun-injuries-people-are-using-it-anyway/>

Cannuscio, C. C., Meisel, Z. F., & Feuerstein-Simon, R. (2019, September 16). Social justice is the foundation of healthcare and medical education. *The Philadelphia Inquirer*.

Centers for Disease Control and Prevention, & Centers for Disease Control and Prevention. (2004). Leading causes of death, 1900-1998.

Centers for Disease Control. (2017). Web-based injury statistics query and reporting system (WISQARS) fatal injuries: Fatal injury reports. *Atlanta, GA: National Center for Injury Prevention Control*.

Centers for Disease Control. (2017). Web-based injury statistics query and reporting system (WISQARS) nonfatal injuries: Nonfatal injury reports. *Atlanta, GA: National Center for Injury Prevention Control*.

Chapman, S., Alpers, P., & Jones, M. (2016). Association between gun law reforms and intentional firearm deaths in Australia, 1979-2013. *Jama*, 316(3), 291-299.

Comerci, G. D. (1996). Efforts by the American Academy of Pediatrics to prevent and reduce violence and its effects on children and adolescents. *Bulletin of the New York Academy of medicine*, 73(2), 398.

Curran, E. (2019). I Remember the First Time I Saw a Teenager Die. *The New York Times*.

Curtin, S. C., & Heron, M. P. (2019). Death rates due to suicide and homicide among persons aged 10–24: United States, 2000–2017.

Dahlberg, L. L., & Mercy, J. A. (2009). The history of violence as a public health issue.

Department of Health and Human Services USA. (1980). *Promoting health, preventing disease: Objectives for the nation*. Department of Health and Human Services.

Devries, K., Watts, C., Yoshihama, M., Kiss, L., Schraiber, L. B., Deyessa, N., ... & Berhane, Y. (2011). Violence against women is strongly associated with suicide attempts: evidence from the WHO multi-country study on women's health and domestic violence against women. *Social science & medicine*, 73(1), 79-86.

Dube, S. R., Anda, R. F., Felitti, V. J., Chapman, D. P., Williamson, D. F., & Giles, W. H. (2001). Childhood abuse, household dysfunction, and the risk of attempted suicide throughout the life span: findings from the Adverse Childhood Experiences Study. *Jama*, 286(24), 3089-3096.

Duggan, M. (2003). Guns and suicide. *Evaluating gun policy: Effects on crime and violence*, 41-73.

Dyrbye, L. N., Thomas, M. R., Massie, F. S., Power, D. V., Eacker, A., Harper, W., ... & Sloan, J. A. (2008). Burnout and suicidal ideation among US medical students. *Annals of internal medicine*, 149(5), 334-341.

Dyrda, L. (2017, January 9). Meet the 15 physician members of the 115th US Congress: Meet the 15 physician members of the 115th US Congress. Retrieved from <https://www.beckershospitalreview.com/hospital-management-administration/meet-the-15-physician-members-of-the-115th-us-congress.html>

Ewing, J. A. (1984). Detecting alcoholism: the CAGE questionnaire. *Jama*, 252(14), 1905-1907.

Fabio, A., Sauber-Schatz, E. K., Barbour, K. E., & Li, W. (2009). The association between county-level injury rates and racial segregation revisited: a multilevel analysis. *American journal of public health, 99*(4), 748-753.

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., ... & Marks, J. S. (2019). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American journal of preventive medicine, 56*(6), 774-786.

Fernández-Castillo, N., & Cormand, B. (2016). Aggressive behavior in humans: genes and pathways identified through association studies. *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics, 171*(5), 676-696.

Fielding, J. (2017, February 27). Gun Violence Is a Public Health Crisis. Retrieved from <https://www.usnews.com/opinion/civil-wars/articles/2017-02-27/treat-gun-violence-like-a-public-health-crisis>

Fingerhut, L. A., Ingram, D. D., & Feldman, J. J. (1992). Firearm and nonfirearm homicide among persons 15 through 19 years of age: differences by level of urbanization, United States, 1979 through 1989. *JAMA, 267*(22), 3048-3053.

Fox, J. A., & Swatt, M. L. (2008). *The recent surge in homicides involving young Black males and guns: Time to reinvest in prevention and crime control*. Boston, MA: Northeastern University.

Frattaroli, S., Webster, D. W., & Wintemute, G. J. (2013). Implementing a public health approach to gun violence prevention: the importance of physician engagement. *Annals of internal medicine, 158*(9), 697-698.

Galtung, J. (1969). Violence, peace, and peace research. *Journal of peace research, 6*(3), 167-191.

Gee, G. C., & Ford, C. L. (2011). Structural racism and health inequities: old issues, new directions. *Du Bois review: social science research on race, 8*(1), 115-132.

Gilchick, R. A. (2018). *The Physician's Role in Firearm Safety: a report of the Council on Science and Public Health*.

Ginwright, S. (2018). The future of healing: Shifting from trauma informed care to healing centered engagement. *Occasional Paper, 25*.

Goldberg, A. J., Toto, J. M., Kulp, H. R., Lloyd, M. E., Gaughan, J. P., Seamon, M. J., & Charles, S. P. (2010). An analysis of inner-city students' attitudes towards

violence before and after participation in the “Cradle to Grave” programme. *Injury*, 41(1), 110-115.

Goldstick, J. E., Carter, P. M., Walton, M. A., Dahlberg, L. L., Sumner, S. A., Zimmerman, M. A., & Cunningham, R. M. (2017). Development of the SaFETy score: a clinical screening tool for predicting future firearm violence risk. *Annals of internal medicine*, 166(10), 707-714.

Gondi, S., Pomerantz, A. G., & Sacks, C. A. (2019). Extreme risk protection orders: an opportunity to improve gun violence prevention training. *Academic medicine*, 94(11), 1649-1653.

Gray, S. (2019, September 18). UMass Medical School students incorporating firearm safety into health care education. Retrieved from <https://www.umassmed.edu/news/news-archives/2019/09/umass-medical-school-students-incorporating-firearm-safety-in-health-care-education/>

Guttentag, J. M., & Wachter, S. M. (1980). *Redlining and public policy*. New York University, Graduate School of Business Administration, Salomon Brothers Center for the Study of Financial Institutions.

Haslam, M. (2018). At Temple, a med student faces a new reality of guns. *The Philadelphia Inquirer*.

He, K., & Sakran, J. V. (2019). Elimination of the moratorium on gun research is not enough: the need for the CDC to set a budgetary agenda. *JAMA surgery*, *154*(3), 195-196.

Heckman, C. J., Egleston, B. L., & Hofmann, M. T. (2010). Efficacy of motivational interviewing for smoking cessation: a systematic review and meta-analysis. *Tobacco control*, *19*(5), 410-416.

Hillier, A. E. (2003). Redlining and the home owners' loan corporation. *Journal of Urban History*, *29*(4), 394-420.

Hillier, A. E. (2005). Residential security maps and neighborhood appraisals: The Home Owners' Loan Corporation and the case of Philadelphia. *Social Science History*, *29*(2), 207-233.

Hohl, B. C., Wiley, S., Wiebe, D. J., Culyba, A. J., Drake, R., & Branas, C. C. (2017). Association of drug and alcohol use with adolescent firearm homicide at individual, family, and neighborhood levels. *JAMA internal medicine*, *177*(3), 317-324.

Holman, D. M., Ports, K. A., Buchanan, N. D., Hawkins, N. A., Merrick, M. T., Metzler, M., & Trivers, K. F. (2016). The association between adverse childhood

experiences and risk of cancer in adulthood: a systematic review of the literature. *Pediatrics*, 138(Supplement 1), S81-S91.

Hughes, K. C., & Shin, L. M. (2011). Functional neuroimaging studies of post-traumatic stress disorder. *Expert review of neurotherapeutics*, 11(2), 275-285.

Jacoby, S. F., Dong, B., Beard, J. H., Wiebe, D. J., & Morrison, C. N. (2018). The enduring impact of historical and structural racism on urban violence in Philadelphia. *Social Science & Medicine*, 199, 87-95.

Jones, N., Nguyen, J., Strand, N. K., & Reeves, K. (2018). What Should Be the Scope of Physicians' Roles in Responding to Gun Violence?. *AMA journal of ethics*, 20(1), 84-90.

Kalter, L. (2019, August 6). The disease of gun violence. Retrieved from <https://www.aamc.org/news-insights/disease-gun-violence>

Katel, J. (2017, July 28). Miami's Hip Hop Cardiologist Dr. Bernard Ashby Starts A Record Label To Fight Gun Violence. Retrieved from <https://www.henrystonemusic.com/miamis-hip-hop-cardiologist-dr-bernard-ashby-starts-a-record-label-to-fight-gun-violence/>

Keane, T. M., Street, A. E., & Stafford, J. (2004). The Assessment of Military-Related PTSD.

Kellermann, A. L., Rivara, F. P., Rushforth, N. B., Banton, J. G., Reay, D. T., Francisco, J. T., ... & Somes, G. (1993). Gun ownership as a risk factor for homicide in the home. *New England Journal of Medicine*, 329(15), 1084-1091.

Kellermann, A. L., & Rivara, F. P. (2013). Silencing the science on gun research. *Jama*, 309(6), 549-550.

Kochanek, K. D., Murphy, S. L., Xu, J., & Arias, E. (2019). Deaths: final data for 2017.

Knopov, A., Sherman, R. J., Raifman, J. R., Larson, E., & Siegel, M. B. (2019). Household gun ownership and youth suicide rates at the state level, 2005–2015. *American journal of preventive medicine*, 56(3), 335-342.

Krasnoff, M., & Moscati, R. (2002). Domestic violence screening and referral can be effective. *Annals of Emergency Medicine*, 40(5), 485-492.

Lasagna, L. (1964). Hippocratic Oath--Modern Version. *WGBH Educational Foundation*.

Lindson-Hawley, N., Thompson, T. P., & Begh, R. (2015). Motivational interviewing for smoking cessation. *Cochrane Database of Systematic Reviews*, (3).

Loveland-Jones, C., Ferrer, L., Charles, S., Ramsey, F., van Zandt, A., Volgraf, J., ... & Rappold, J. (2016). A prospective randomized study of the efficacy of “Turning Point,” an inpatient violence intervention program. *Journal of trauma and acute care surgery*, *81*(5), 834-842.

Lu, Y., & Temple, J. R. (2019). Dangerous weapons or dangerous people? The temporal associations between gun violence and mental health. *Preventive medicine*, *121*, 1-6.

McGinty, E. E., Webster, D. W., Jarlenski, M., & Barry, C. L. (2014). News media framing of serious mental illness and gun violence in the United States, 1997-2012. *American journal of public health*, *104*(3), 406-413.

McLean, R. M., Harris, P., Cullen, J., Maier, R. V., Yasuda, K. E., Schwartz, B. J., & Benjamin, G. C. (2019). Firearm-related injury and death in the United States: a call to action from the nation’s leading physician and public health professional organizations. *Ann Intern Med*, (Aug).

McMillion, R. (2015). Calling for a Cure: The ABA joins medical organizations in advocating steps to curb gun violence. *ABA Journal*, *101*(6), 66-66.

Meindl, J. N., & Ivy, J. W. (2017). Mass shootings: The role of the media in promoting generalized imitation. *American journal of public health, 107*(3), 368-370.

Military Health System Communications Office. (2019, July 19). Stop the Bleed: A battlefield innovation on civilian soil. Retrieved from <https://health.mil/News/Articles/2019/07/19/Stop-the-Bleed-A-battlefield-innovation-on-civilian-soil?type=Reports>

Miller, M., & Hemenway, D. (2008). Guns and suicide in the United States. *New England Journal of Medicine, 359*(10), 989-991.

Miller, M., Barber, C., Young, M., Azrael, D., Mukamal, K., & Lawler, E. (2012). Veterans and suicide: A reexamination of the national death index–linked national health interview survey. *American journal of public health, 102*(S1), S154-S159.

Minino, A. (2010). Mortality among teenagers 12–19 years: United States, 1999–2006. *NCHS data brief, (37)*.

Mission, Vision and Core Values. (n.d.). Retrieved November 9, 2019, from <https://medicine.howard.edu/about-us/mission-vision-and-core-values>

Molnar, H. (2018, February 16). Medical Student Mission Statement and Education Program Objectives. Retrieved from <https://www.hopkinsmedicine.org/som/mission.html>

Monson, C. M., Price, J. L., Rodriguez, B. F., Ripley, M. P., & Warner, R. A. (2004). Emotional deficits in military-related PTSD: An investigation of content and process disturbances. *Journal of Traumatic Stress, 17*(3), 275-279.

Mozaffarian, D., Hemenway, D., & Ludwig, D. S. (2013). Curbing gun violence: lessons from public health successes. *JAMA, 309*(6), 551-552.

Murphy, S. L., Xu, J., Kochanek, K. D., Curtin, S. C., & Arias, E. (2017). Deaths: final data for 2015.

National Center for Health Statistics (US), & National Center for Health Services Research. (2011). *Health, United States*. US Department of Health, Education, and Welfare, Public Health Service, Health Resources Administration, National Center for Health Statistics.

O'Campo, P., Kirst, M., Tsamis, C., Chambers, C., & Ahmad, F. (2011). Implementing successful intimate partner violence screening programs in health care settings: evidence generated from a realist-informed systematic review. *Social science & medicine, 72*(6), 855-866.

Olson, L. M., Christoffel, K. K., & O'Connor, K. G. (2007). Pediatricians' involvement in gun injury prevention. *Injury Prevention, 13*(2), 99-104.

Pallin, R., Spitzer, S. A., Ranney, M. L., Betz, M. E., & Wintemute, G. J. (2019). Preventing firearm-related death and injury. *Annals of internal medicine, 170*(11), ITC81-ITC96.

Parker, K., Horowitz, J., Igielnik, R., Oliphant, B., & Brown, A. (2017). *America's complex relationship with guns: an in-depth look at the attitudes and experiences of US adults*. Pew Research Center.

Patterson, P. J., & Smith, L. R. (1987). Firearms in the home and child safety. *American Journal of Diseases of Children, 141*(2), 221-223.

Pierson, J., Viera, A. J., Barnhouse, K. K., Tulskey, J. A., Richman, B. D., & Goldstein, A. O. (2014). Physician attitudes and experience with permit applications for concealed weapons. *New England journal of medicine, 370*(25), 2453-2454.

Pinals, D. A., Appelbaum, P. S., Bonnie, R., Fisher, C. E., Gold, L. H., & Lee, L. W. (2015). American Psychiatric Association: position statement on firearm access, acts of violence and the relationship to mental illness and mental health services. *Behavioral sciences & the law, 33*(2-3), 195-198.

Pinderhughes, H., Davis, R., & Williams, M. (2015). Adverse community experiences and resilience: A framework for addressing and preventing community trauma.

Pinholt, E. M., Mitchell, J. D., Butler, J. H., & Kumar, H. (2014). “Is there a gun in the home?” Assessing the risks of gun ownership in older adults. *Journal of the American Geriatrics Society*, 62(6), 1142-1146.

Ports, K. A., Ford, D. C., & Merrick, M. T. (2016). Adverse childhood experiences and sexual victimization in adulthood. *Child abuse & neglect*, 51, 313-322.

Public Health Management Corporation, Community Health Database. (2016). Community Health Needs Assessment. *Philadelphia, PA: Temple University Hospital*.

Public Law. (1996). LAW 104–208—SEPT. 30, 1996: Omnibus Consolidated Appropriations Act, 1997. In *104th Congress*.

Puttagunta, R., Coverdale, T. R., & Coverdale, J. (2016). What is taught on firearm safety in undergraduate, graduate, and continuing medical education? A review of educational programs. *Academic psychiatry*, 40(5), 821-824.

Ransford, C., Johnson, T., Decker, B., & Slutkin, G. (2016). The Relationship between the Cure Violence Model and Citywide Increases and Decreases in Killings in Chicago (2000-2016). *Cure Violence Report*.

Reading, R. (2006). The enduring effects of abuse and related adverse experiences in childhood. A convergence of evidence from neurobiology and epidemiology. *Child: Care, Health and Development*, 32(2), 253-256.

Riddick Jr, F. A. (2003). The code of medical ethics of the American Medical Association. *The Ochsner Journal*, 5(2), 6.

Rosenberg, N. (2016). How to Tell a Mother Her Child Is Dead. *The New York Times*.

Rothenberger, D. A. (2017). Physician burnout and well-being: a systematic review and framework for action. *Diseases of the Colon & Rectum*, 60(6), 567-576.

Schiller, J. S., Lucas, J. W., & Peregoy, J. A. (2012). Summary health statistics for US adults: national health interview survey, 2011.

Schmitz Jr, W. M., Allen, M. H., Feldman, B. N., Gutin, N. J., Jahn, D. R., Kleespies, P. M., ... & Simpson, S. (2012). Preventing suicide through improved training in suicide risk assessment and care: An American Association of Suicidology Task Force

report addressing serious gaps in US mental health training. *Suicide and Life-Threatening Behavior*, 42(3), 292-304.

Seyfried, L. S., Kales, H. C., Ignacio, R. V., Conwell, Y., & Valenstein, M. (2011). Predictors of suicide in patients with dementia. *Alzheimer's & dementia*, 7(6), 567-573.

Sher, H. (2018, March 12). What I Saw Treating the Victims From Parkland Should Change the Debate on Guns. Retrieved from <https://www.theatlantic.com/politics/archive/2018/02/what-i-saw-treating-the-victims-from-parkland-should-change-the-debate-on-guns/553937/>

Siddique, K. (2014, October 15). California's Gun Violence Restraining Order Can Prevent Gun Violence. Retrieved from <https://time.com/3507748/gun-violence-restraining-order/>

Slutkin, G. (2013). Violence is a contagious disease. In *Contagion of Violence: Workshop Summary*. Washington, DC: National Academy of Sciences (pp. 94-111).

Slutkin, G., Ransford, C. L., Decker, B., & Volker, K. (2014). Cure Violence—an evidence based method to reduce shootings and killings. *World Bank Paper*.

Slutkin, G., Ransford, C., & Decker, R. B. (2015). Cure violence: Treating violence as a contagious disease. In *Envisioning criminology* (pp. 43-56). Springer, Cham.

Slutkin, G., Ransford, C., & Zvetina, D. (2018). How the health sector can reduce violence by treating it as a contagion. *AMA journal of ethics*, 20(1), 47-55.

Smith, J. R. (2015). Unequal burdens of loss: Examining the frequency and timing of homicide deaths experienced by young Black men across the life course. *American journal of public health*, 105(S3), S483-S490.

Strong, B. L., Ballard, S. B., & Braund, W. (2016). The American College of Preventive Medicine policy recommendations on reducing and preventing firearm-related injuries and deaths. *American journal of preventive medicine*, 51(6), 1084-1089.

Swanson, J. W., McGinty, E. E., Fazel, S., & Mays, V. M. (2015). Mental illness and reduction of gun violence and suicide: bringing epidemiologic research to policy. *Annals of epidemiology*, 25(5), 366-376.

Talley, C. L., Campbell, B. T., Jenkins, D. H., Barnes, S. L., Sidwell, R. A., Timmerman, G., ... & Ficke, J. (2019). Recommendations from the American College of Surgeons Committee on Trauma's Firearm Strategy Team (FAST) Workgroup: Chicago Consensus I. *Journal of the American College of Surgeons*, 228(2), 198-206.

Teismann, T., Förtsch, E. M. A., Baumgart, P., Het, S., & Michalak, J. (2014). Influence of violent video gaming on determinants of the acquired capability for suicide. *Psychiatry research*, 215(1), 217-222.

Vella, M. A., Warshauer, A., Tortorello, G., Fernandez-Moure, J., Giacolone, J., Chen, B., ... & Reilly, P. M. (2020). Long-term functional, psychological, emotional, and social outcomes in survivors of firearm injuries. *JAMA surgery*, 155(1), 51-59.

Veroude, K., Zhang-James, Y., Fernández-Castillo, N., Bakker, M. J., Cormand, B., & Faraone, S. V. (2016). Genetics of aggressive behavior: An overview. *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics*, 171(1), 3-43.

Voith, L. A., Anderson, R. E., & Cahill, S. P. (2017). Extending the ACEs framework: Examining the relations between childhood abuse and later victimization and perpetration with college men. *Journal of interpersonal violence*, 0886260517708406.

Webster, D. W., & Vernick, J. S. (2014). *Updated evidence and policy developments on reducing gun violence in America*. JHU Press.

Webster, D. (n.d.). A Critical Gap in Gun Violence Data. Retrieved October 8, 2019, from <https://americanhealth.jhu.edu/article/critical-gap-gun-violence-data>

Weinberger, S. E., Hoyt, D. B., Lawrence, H. C., Levin, S., Henley, D. E., Alden, E. R., ... & Hubbard, W. C. (2015). Firearm-related injury and death in the United States: a call to action from 8 health professional organizations and the American Bar Association. *Annals of internal medicine*, *162*(7), 513-516.

Weiner, J., Wiebe, D. J., Richmond, T. S., Beam, K., Berman, A. L., Branas, C. C., ... & Hargarten, S. (2007). Reducing firearm violence: a research agenda. *Injury Prevention*, *13*(2), 80-84.

Whitehill, J. M., Webster, D. W., Frattaroli, S., & Parker, E. M. (2014). Interrupting violence: how the CeaseFire Program prevents imminent gun violence through conflict mediation. *Journal of urban health*, *91*(1), 84-95.

Whitfield, C. L., Anda, R. F., Dube, S. R., & Felitti, V. J. (2003). Violent childhood experiences and the risk of intimate partner violence in adults: Assessment in a large health maintenance organization. *Journal of interpersonal violence*, *18*(2), 166-185.

Williamson, A. A., Guerra, N. G., & Tynan, W. D. (2014). The role of health and mental health care providers in gun violence prevention. *Clinical Practice in Pediatric Psychology*, *2*(1), 88.

Wintemute, G. J. (1999). The future of firearm violence prevention: building on success. *JAMA*, *282*(5), 475-478.

Wintemute, G. J. (2015). The epidemiology of firearm violence in the twenty-first century United States. *Annual Review of Public Health, 36*, 5-19.

Wolf, A., Gray, R., & Fazel, S. (2014). Violence as a public health problem: An ecological study of 169 countries. *Social Science & Medicine, 104*, 220-227.

World Medical Association. (2015). WMA declaration of Geneva. *International Journal of Person Centered Medicine, 4*(3), 157.

Xu, J., Murphy, S. L., Kochanek, K. D., Bastian, B., & Arias, E. (2018). Deaths: final data for 2016.

Zabel, S. (2014). Docs v Glocks: The Need for First Amendment Protection in Preventative Care. *Temp. Pol. & Civ. Rts. L. Rev., 24*, 483.